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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/075,043	02/12/2002	David Tseng	56956 (71987)	7505
21874	7590	03/17/2004	EXAMINER	
EDWARDS & ANGELL, LLP P.O. BOX 55874 BOSTON, MA 02205			NGUYEN, KHIEM D	
			ART UNIT	PAPER NUMBER
			2823	

DATE MAILED: 03/17/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/075,043

Applicant(s)

TSENG ET AL.

Examiner

Khiem D Nguyen

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-41 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-41 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 February 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Response to Amendment*

The non-final rejection as set forth in paper No. (4) is withdrawn in response to applicants' amendments. A new rejection is made as set forth in this Office Action.

Claims (1-41) are pending in the application.

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-21 and 33-41 are rejected under 35 U.S.C. 102(b) as being anticipated by Fogal et al. (U.S. Patent 6,117,693).

In re claims 1, 12, and 33, **Fogal** discloses a wire bonding method for use in fabrication of a semiconductor package, comprising the steps of (col. 3, line 17 to col. 6, line 38 and **FIGS. 1-6**): (1) preparing a substrate (**FIG. 4: 10**) composed of a plurality of substrate units, and mounting at least a chip (**FIG. 4: 12**) on each of the substrate units; (2) providing a wire bonding station (**FIG. 6: 70**) at least having a wire bonding mechanism and a testing mechanism (**FIG. 6: 24**) so as to allow the substrate mounted with the chips to be introduced into the wire bonding mechanism; (3) forming a plurality of bonding wires (**FIG. 4: 32**) on one substrate unit of the substrate via the wire bonding mechanism so as to electrically connect a corresponding chip to the substrate unit; (4) introducing the wire-bonded substrate unit into the testing mechanism for performing an

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O/S (open/short) test (col. 4, line 64 to col. 5, line 2 and **FIG. 1**), and forming bonding wires on a next adjacent substrate of the substrate simultaneously moved into the wiring bonding mechanism (col. 6, lines 7-8-27); wherein if test results indicate no occurrence of wire opening or short circuit for the bonding wires formed on the wire-bonded substrate unit, then step (5) proceeds (col. 2, lines 29-51 and **FIG. 1**); wherein if the test results indicate occurrence of wire opening or short circuit for the bonding wires on the wire-bonded substrate unit, the testing mechanism is prompted to generate a control signal to the wire bonding mechanism for interrupting a wire bonding process, whereby the wire bonding mechanism is adjusted or repaired (col. 2, lines 29-38), or other causes of wire opening or short circuit are traced and overcome, so as to rework the bonding wires on the wire-bonded substrate unit, and then repeat the step (4); (5) repeating the step (3) until all the substrate units of the substrate are wire-bonded and tested with the O/S test, and then proceeding with step (6); and (6) moving the wire-bonded and tested substrate out of the wire bonding station, for allowing the substrate to be used in subsequent package fabrication (col. 2, lines 38-51).

In re claims 2, 13, and 34, **Fogal** discloses wherein the testing mechanism includes at least a test socket and a tester electrically connected to the test socket (**FIG. 6**).

In re claims 3, 14, and 35, **Fogal** discloses wherein the test socket is used to come into contact with the wire-bonded substrate unit, allowing the tester (**FIG. 6: 24**) to perform the O/S test for the bonding wires on the substrate unit through the test socket (col. 4, line 64 to col. 5, line 2).

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In re claims 4, 15, 36, and 38, **Fogal** discloses wherein the tester (**FIG. 6: 24**) at least includes: a testing module electrically connected to the test socket, for performing the O/S test through the test socket (col. 4, line 64 to col. 5, line 2); and a controlling module electrically connected to the testing module and the wire bonding mechanism for receiving a test-failure signal from the testing module in occurrence of wire opening or short circuit, generating a control signal to the wire bonding mechanism (**FIG. 6: 70**) so as to interrupt the wire bonding process in the wire bonding mechanism; and a displaying module connected to the testing module, for displaying test results from the test module (col. 6, lines 18-38).

In re claims 5, 16, and 39, **Fogal** discloses wherein the tester is further electrically connected to a test socket of at least another wire bonding station so as to simultaneously control test sockets in a plurality of wire bonding, so as to simultaneously control test sockets in a plurality of wire bonding stations for performing the O/S test (col. 6, lines 18-38 and **FIGS. 1 and 6**).

In re claims 6 and 17, **Fogal** discloses wherein the wire bonding station further includes a handling mechanism for moving the substrate into or out of the wire bonding station (col. 6, lines 18-38 and **FIG. 6**).

In re claims 7 and 18, **Fogal** discloses wherein the wire bonding station is a wire bonding machine internally provided with the testing mechanism and the testing mechanism is disposed at a downstream position relative to the wire bonding mechanism in the wire bonding machine (**FIG. 6**).

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In re claims 8 and 19, **Fogal** discloses wherein the wire bonding station includes a wire bonding machine internally provided with at least a test socket, and a tester (**FIG. 6: 24**) externally connected to the wire bonding machine (**FIG. 6: 70**) and electrically connected to the test socket, which test socket is disposed at a downstream position relative to the wire bonding mechanism.

In re claims 9 and 37, **Fogal** discloses wherein the step (4), upon receiving the control signal from the testing mechanism the wire bonding mechanism interrupts the wire bonding process after the next adjacent substrate unit is completely wire-bonded (col. 6, lines 18-38).

In re claims 10, 20, and 40, **Fogal** discloses wherein the substrate units of the substrate are arranged in a matrix type (**FIGS. 1, 2, and 6**).

In re claims 11, 21, and 41, **Fogal** discloses wherein the substrate units of the substrate are arranged in a single-array type (**FIGS. 1, 2, and 6**).

2. Claims 22-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Fogal et al. (U.S. Patent 6,117,693).

In re claim 22, **Fogal** discloses a wire bonding method for use in fabrication of a semiconductor package, comprising the steps of (col. 3, line 17 to col. 6, line 38 and **FIGS. 1-6**): (1) preparing a substrate (**FIG. 4: 10**) composed of a plurality of substrate units, and mounting at least a chip (**FIG. 4: 12**) on each of the substrate units; (2) providing a wire bonding station (**FIG. 6: 70**) at least having a wire bonding mechanism and a testing mechanism (**FIG. 6: 24**) so as to allow the substrate mounted with the chips to be introduced into the wire bonding mechanism; (3) forming a plurality of bonding

wires (**FIG. 4: 32**) on one substrate unit of the substrate via the wire bonding mechanism so as to electrically connect a corresponding chip to the substrate unit; (4) introducing the wire-bonded substrate unit into the testing mechanism for performing an O/S (open/short) test (col. 4, line 64 to col. 5, line 2 and **FIG. 1**), and forming bonding wires on a next adjacent substrate of the substrate simultaneously moved into the wiring bonding mechanism (col. 6, lines 7-27); (5) proceeding with step (7) if test result indicate no occurrence of wire opening or short circuit for the bonding wires formed on the wire-bonded substrate unit (col. 5, lines 47-60); wherein, if no wire opening or short circuit occurs; or else, a controlling module of the testing mechanism determining if a pre-inputted command to the testing mechanism is to interrupt a wiring bonding process in the wire bonding mechanism; wherein, the pre-inputted command interruption of the wire bonding process, then step (6) proceeds; or else, step (9) proceeds; (6) generating a control signal via the controlling module of the testing mechanism to the wire bonding mechanism for interrupting the wire bonding process, so as to trace and overcome causes of wire opening or short circuit, and to rework the wire-bonded substrate unit (col. 6, lines 18-38); then repeating the step (4); (7) repeating the step (3) until all the substrate units of the substrate are wire-bonded and tested with the O/S test, and then proceeding with step (8) (**FIG. 1**); (8) moving the wire-bonded and tested substrate out of the wire bonding station, for allowing the substrate to be used in subsequent package fabrication (col. 5, lines col. 5, lines 47-60); (9) displaying test results produced from the step (5) via a displaying module of the testing mechanism, and repeating the step (3) until all the substrate units of the substrate are wire-bonded and tested with the O/S test; then

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proceeding with step (10); (10) moving the wire-bonded and tested substrate out of the wire bonding station; and (11) reworking wire-opened or short-circuited substrate units, and tracing and overcoming causes of wire opening or short circuit according to the displayed test results by the displaying module of the testing mechanism (col. 6, lines 18-38).

In re claim 23, **Fogal** discloses wherein the testing mechanism includes at least a test socket and a tester electrically connected to the test socket (**FIG. 6**).

In re claim 24, **Fogal** discloses wherein the test socket is used to come into contact with the wire-bonded substrate unit, allowing the tester (**FIG. 6: 24**) to perform the O/S test for the bonding wires on the substrate unit through the test socket (col. 4, line 64 to col. 5, line 2).

In re claim 25, **Fogal** discloses wherein the tester (**FIG. 6: 24**) at least includes the controlling module, the displaying module and a testing module, the testing module being electrically connected to the test socket so as to perform the O/S test for the substrate unit through the test socket (col. 4, line 64 to col. 5, line 2); and transmit test results to the controlling module and the displaying module (col. 6, lines 18-38)

In re claim 26, **Fogal** discloses wherein the tester is further electrically connected to a test socket of at least another wire bonding station so as to simultaneously control test sockets in a plurality of wire bonding, so as to simultaneously control test sockets in a plurality of wire bonding stations for performing the O/S test (col. 6, lines 18-38 and **FIGS. 1 and 6**).



In re claim 27, **Fogal** discloses wherein the wire bonding station further includes a handling mechanism for moving the substrate into or out of the wire bonding station (col. 6, lines 18-38 and **FIG. 6**).

In re claim 28, **Fogal** discloses wherein the wire bonding station is a wire bonding machine internally provided with the testing mechanism and the testing mechanism is disposed at a downstream position relative to the wire bonding mechanism in the wire bonding machine (**FIG. 6**).

In re claim 29, **Fogal** discloses wherein the wire bonding station includes a wire bonding machine internally provided with at least a test socket, and a tester (**FIG. 6: 24**) externally connected to the wire bonding machine (**FIG. 6: 70**) and electrically connected to the test socket, which test socket is disposed at a downstream position relative to the wire bonding mechanism.

In re claim 30, **Fogal** discloses wherein the step (6), upon receiving the control signal from the testing mechanism the wire bonding mechanism interrupts the wire bonding process after the next adjacent substrate unit is completely wire-bonded (col. 6, lines 18-38).

In re claim 31, **Fogal** discloses wherein the substrate units of the substrate are arranged in a matrix type (**FIGS. 1, 2, and 6**).

In re claims 32, **Fogal** discloses wherein the substrate units of the substrate are arranged in a single-array type (**FIGS. 1, 2, and 6**).

***Response to Amendment***

***Response to Arguments***

3. In response to Applicants' argument that Bertolet and AAPA whether taken alone or in combination, fail to teach or suggest performing an open/short (O/S) test on one substrate unit while wire bonding a next adjacent substrate unit in the wire bonding station.

Moreover, there is no teaching or suggestion of providing a wire bonding station having at least a wire bonding mechanism and a testing mechanism that are capable of performing an O/S test on one substrate unit of a substrate while simultaneously wire-bonding the next adjacent substrate unit, examiner respectfully disagree. Applicants are directed to the pages 2 and 3 presented in this Office Action where the newly discovered reference Fogal et al. (U.S. Patent 6,117,693) disclosed the above cited claim limitations.

***Conclusion***

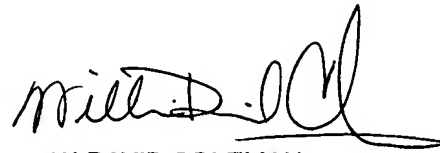
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Khiem D Nguyen whose telephone number is (571) 272-1865. The examiner can normally be reached on Monday-Friday (8:00 AM - 5:00 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Olik Chaudhuri can be reached on (571) 272-1855. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-3432 for regular communications and (703) 305-3432 for After Final communications.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

K.N.  
March 10, 2004

A handwritten signature in black ink, appearing to read "W. David Coleman", with a long horizontal flourish extending to the right.

**W. DAVID COLEMAN**  
**PRIMARY EXAMINER**